



United States  
Department of Agriculture

*Office of the Chief Information Officer (OCIO)*  
*Year 2000 Program Office*

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# **Year 2000 Independent Verification and Validation (IV&V) Guide**

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## 1.0 Introduction and Scope

### 1.1 Introduction

This guide was designed to assist all Agencies and Staff Offices in implementing an Independent Verification and Validation (IV&V) program. The intent is to provide department-wide direction to establish a program to verify and validate Year 2000 compliance. This guide includes the procedures outlined in the USDA IV&V Program in a letter sent from the CIO to the Executive Information Technology Investment Review Board Members. It involves projects for all converted and acquired systems including information technology, telecommunications and vulnerable systems and processes.

IV&V is traditionally used to assess project development products during the system life cycle and to provide measures to correct problems and deficiencies before the projects systems are implemented. However, for Year 2000 IV&V efforts we are using the traditional processes in all projects involving mission-critical systems to detect errors and omissions as those systems are being renovated or replaced. Evaluated products include system requirements, system specifications and detailed designs documentation, source code, and test plans for all replaced systems. The principal focus of an IV&V program is to detect errors as early as possible in the projects system development or renovation life cycle to eliminate costly rework and delays and to insure continuity of business operations.

### 1.2 Scope of Year 2000 IV&V Activities

Within the USDA, Year 2000 activities are grouped into three primary technology areas: Information Technology, Telecommunications, and Vulnerable Systems and Processes. Each area requires IV&V for projects considered as ***high priority mission-critical systems development or renovation***. Attention should also be given to the preparedness of critical suppliers/vendors, business partners and states or universities.

### 1.3 USDA Year 2000 Needs

An IV&V effort evaluates system development products; reviews and conducts spot checks on testing activities; and oversees the development effort from project start-up to completion. In the case of Year 2000 projects, the IV&V methodology is applied to ensure that the system under evaluation is Year 2000 compliant.

USDA recommends the use of oversight evaluation, management reviews, sample testing, and document evaluation techniques in conducting a strategic and technical assessment of replacement systems. Where existing systems have been repaired or embedded chips replaced the IV&V effort must verify system integrity and functionality.

Generally, an Agency Administrator would request an IV&V effort for projects that are high risk or for high priority mission critical where assurance of program delivery is required. The OCIO may identify systems or projects critical to program delivery and initiate an IV&V effort on the Secretary's behalf. Additionally, the OCIO may require an IV&V effort whenever there is a question or concern associated with cost, risk or project management. The Office of Inspector General plans to continue its independent review of Year 2000 progress as well. The CIO's office will coordinate its IV&V requirements with the OIG so that duplication of efforts can be avoided.

In determining when an IV&V effort is needed these guidelines should be followed by Agency Administrators:

- Mandatory on all high risk mission critical systems,
- Mandatory when the remediation or testing effort begins to fall behind schedule,
- Desirable when a system is being replaced,
- Desirable on all repair projects that are progressing slowly,
- Desirable when management feels it is in the best interest of the Agency

### 1.4 Contents of the IV&V Guide

This Guide provides USDA project managers and analysts a systematic application of IV&V processes and techniques to Year 2000 projects and products. It describes the methodologies, procedures, and tools that analysts could use to conduct IV&V activities.

## 1.5 Objectives of IV&V Program

The objectives of the USDA Year 2000 IV&V program can be summarized as follows:

- Ensure that mission-critical systems are Year 2000 compliant and to assure continuity of program delivery,
- Assist the Year 2000 Program Office in meeting the OMB deadline of 31 March 1999,
- Support the Year 2000 Program Office to achieve compliance of mission-critical systems.

## 1.6 Benefits of IV&V

The IV&V effort should be used to provide an Agency Administrator with:

- Independent assessment of the quality of plans, documentation and products,
- Validation of directions and approaches,
- Higher success rates for projects, more efficient use of resources and more effective program delivery to USDA customers,
- Avoidance of cost overruns and delays.

## 1.7 IV&V Initiation and Closeout Information

The CIO has received authority from the Procurement Executive to initiate an IV&V effort without using the Contract Advisory and Assistance process. This is available to assist the Agency Administrator and Agency Executive Sponsor who need to augment Quality Assurance capability or who desire to use an independent contractor to perform the IV&V work. To use the CIO IV&V authority program managers submit the IV&V Request form included in *Appendix A*. The following information is required by the Year 2000 Program Executive Director for this purpose.

1.	Agency Name
2.	Executive Sponsors Name
3.	Date Submitted
4.	System Name
5.	System Business Function

<b>6.</b>	Estimated Cost of IV&V Effort
<b>7.</b>	Estimated Start Date
<b>8.</b>	Estimated Completion Date

The following information is required upon completion of the IV&V effort. This information will provide the Year 2000 Program Office with the necessary information to track actual expenditures and total cost of all IV&V activities.

<b>9.</b>	Actual Cost of IV&V Effort
<b>10.</b>	Actual Start Date
<b>11.</b>	Actual Completion Date

## 1.8 IV&V Program Management

OCIO will have overall responsibility for coordinating the IV&V program for Year 2000 to ensure procedures will be the same across the Department and associated agencies. The OCIO staff will be available to work with Mission Area Senior Executives and Agency representatives to write statements of work (SOW) whose objective is to acquire assistance to perform IV&V assessments. The IV&V effort shall review both the managerial and technical functions covering the full lifecycle of Year 2000 remediation activities for compliance. For information purposes several SOW templates are included in Appendix B.

## 1.9 IV&V Reporting

As IV&V efforts are initiated interim reports will be submitted in writing as part of the monthly status report identifying findings and recommendations. Upon completing the effort a final report and a summary of recommended actions will be forwarded to the OCIO Year 2000 Program Office. IV&V efforts at the Agency level should report directly to Agency Administrators.

## **2.0 The Independent Verification and Validation (IV&V)**

To achieve the goal of Year 2000 compliance, and overall, the success of USDA, our focus must be on successfully completing the Year 2000 conversion for all mission-critical systems prior to March 1999. To use the remaining time as efficiently as possible systems conversion and testing must follow a disciplined practice of sound systems engineering practices. Some of these practices attempt to insure that the converted and remediated system will meet expectations in terms of functionality and performance. These practices are collectively known as Independent Verification and Validation (IV&V).

### **Framework for Defining the IV&V Plan**

- 2.1 The Role of IV&V**
- 2.2 IV&V Objectives**
- 2.3 Developing the IV&V Plan**

### **2.1 The Role of IV&V**

In all projects the role of the IV&V effort remains the same. Usually an independent contractor is tasked to provide an on-going evaluation of the projects overall status and technical progress. This is absolutely necessary to insure that the Mission Area Senior Executives and Agency Administrator is provided with an independent evaluation on the project's cost, schedule, and performance in both the managerial and technical areas. In Year 2000 conversion projects this is even more essential due to the absolute deadline set by time.

### **2.2 IV&V Objectives**

The objective of the IV&V function is to insure that the project is successful. This means that the project management process functions and the technical requirements specifications should be analyzed through the IV&V process. The IV&V approach is to concentrate on the functional and performance aspects of the system design and implementation. The specific IV&V objectives for each project will be determined on a project by project basis, depending on the project constraints and complexity.



## 2.3 Developing The IV&V Plan

The IV&V plan is essential to the success of all Mission Area wide programs. An IV&V plan shall be developed based on the project(s) that are desired to be included in the effort and should normally be reviewed by the OCIO. For the validation phase, the plan will provide multiple levels of test plans, corresponding to the various levels of IV&V activities. A detailed IV&V methodology should be followed to develop a comprehensive set of test procedures and documentation. A number of key considerations are listed in the next sub-sections.

### 2.3.1 *Definition of IV&V Goals*

Specific Year 2000 IV&V goals should be defined in order to guide the program to successful completion on the target date. These goals should address the functional and performance attributes set by the systems user Agency. The goals should be tied to the project milestones for cost, schedule, and performance.

### 2.3.2 *Selection of IV&V Techniques*

Upon defining the IV&V objectives, specific techniques must be selected for each of the project's renovated products. A mapping of the IV&V approaches to the system products is as follows:

#### **Assessment**

- Technical reviews
- Prototyping and simulation
- Consistency analysis

#### **Renovation**

- Technical reviews
- Requirements tracing
- Prototyping and simulation
- Proof of correctness
- Static analysis
- Performance analysis

#### **Testing and Implementation**

- Technical reviews
- Requirements tracing

- Testing, multiple levels
- Proof of correctness
- Code reviews
- Static analysis

### **2.3.3 *Organizational Responsibilities***

This section of the plan describes the organizational structure for the IV&V project. It defines delegation of activities to the organizations involved. Four types of organization are defined here, as follows:

#### **Development Organization**

- Participates in technical reviews
- Ensures traceability
- Constructs prototypes
- Prepares, executes test plans

#### **Independent Test Organization**

- Major testing effort
- Provide objectivity
- Prepare test activities and test plan
- Participates in technical reviews

#### **Software Quality Assurance**

- Assures software quality
- Conducts evaluations through life cycle

#### **Independent IV&V Contractor**

- Insures independent objectivity and evaluation of the customer
- Any or all of the activities described above

#### ***2.3.4 Integration of the IV&V Approaches***

Once objectives are defined, the IV&V team must develop an overall integrated IV&V approach, as follows;

- Integrate IV&V techniques applicable to life cycle phases
- Delegate tasks to project's organizations
- Integration of the approach is dependent upon the nature of the product and the process used to develop it, i.e., the waterfall model, or the incremental development model.

#### ***2.3.5 Problem Tracking***

The IV&V team manager must develop a well defined mechanism for tracking and documenting problems as the main output of the IV&V process. This mechanism must also allow for the routing, distribution and management of these problems to responsible organizations.

#### ***2.3.6 Tracking Test Activities***

Another key element to manage the IV&V effort is a mechanism for tracking the testing effort. This involves data to enable project management to assess the quality and cost of the testing activity.

#### ***2.3.7 Assessment***

Data must also be collected to allow for assessment of the product and the techniques used to develop and correct it. This involves collection of error and failure data.

### **2.4.1 Using Contractor Support**

If an Agency requires contractor support they have two options. They can decide which contractor and contracting vehicle to use or they can ask for assistance from the OCIO Year 2000 Program Office. In either case the IV&V process guide should be used:



## IV&V Process Guide

Process Step	Actions Required	Milestone Dates	Responsibility	Outcome
1. Prioritize Mission Critical Systems	Use the prioritized list of mission-critical systems obtained in developing the Mission Area Contingency Plan.	July 30, 1998	Under/Assistant Secretaries and Agency Administrator	Prioritized list of potential systems for IV&V.
2. Select Systems for IV&V	Review the prioritized list of mission-critical systems and select the systems requiring IV&V based on the criteria in Section 1.3 of this guide.	August 15, 1998	Agency Administrator and Y2K Executive Sponsors	Final list of systems requiring IV&V
3. Determine In-House or Contract Support effort	Determine how the Mission Area can best satisfy the IV&V requirement and still maintain true objectivity.		Under/Assistant Secretaries and Agency Administrator	Memorandum to document the decision and notify the OCIO Y2K Program Office
3. Complete IV&V SOW	Use the IV&V SOW's in Appendix D and the SOW Template provided by the OCIO under separate cover to write the SOW		Y2K Executive Sponsor	Completed IV&V SOW
4. Select IV&V Contractor	Request bids against the SOW from Contractors on GSA schedule, GWAC, or on a preferred vendor list. For contractor support the OCIO can assist in completing this step if desired.		Agency Administrator and Y2K Executive Sponsors	Select IV&V Team.
5. Identify Funding Source	Identify funding source, notify the Contracting Officer and submit IV&V request form in Appendix B to the OCIO		Under/Assistant Secretaries	A fully funded contract for IV&V
6. Begin IV&V Effort	The IV&V effort is initiated with a kick-off meeting revealing the IV&V project schedule and set milestones. OCIO representative attends kick-off meeting.		Y2K Executive Sponsor and Program Manager	A Memorandum submitted to the Under/Assistant Secretaries, Agency Administrator and OCIO
7. Manage IV&V Effort	Provide oversight and project management of the IV&V effort and review progress reports.		Y2K Executive Sponsor and Program Manager	Monthly Progress Reports submitted to Y2K Executive Sponsor and OCIO
8. Take Corrective Action on Findings and Recommendations	Respond to suggestions and recommendations from the IV&V contractor and take the necessary corrective actions.		Y2K Executive Sponsor	Monthly Progress Reports submitted to Y2K Executive Sponsor and OCIO
9. Submit Closeout Report upon Completion	Prepare a closeout report documenting the findings and recommendations and the corrective actions taken		Y2K Executive Sponsor	Closeout Report

### 3.0 The IV&V Guide (Applying IV&V to the Year 2000 Process)

The traditional IV&V process includes analysis and evaluation activities throughout the project life cycle process, from user requirement analysis through validation and implementation. The USDA Year 2000-conversion methodology has been defined in four major phases, namely, awareness, assessment, renovation, and validation. The awareness phase is predominantly about disseminating information throughout the Department, while the remaining three phases involve defining and implementing the necessary date changes and testing the modified system to validate compliance.

The Year 2000 IV&V methodology presented in this guide is an adaptation of IV&V industry practices to the specific needs of the Department. Each of the major development phases in the conversion process will have a number of IV&V activities that are applied in parallel to the development process. In some instances the IV&V analysis will be done subsequent to the conversion work since some of that work has been completed, prior to institutionalizing the IV&V procedures.

#### The IV&V Y2K Process

##### 3.1 Assessment Verification

##### 3.2 Renovation Verification

##### 3.3 Code Validation

### 3.1 Assessment Verification

#### 3.1.1 *Determining Non-Compliance*

Based on the purpose of the assessment phase that determines which application systems fail to pass the Year 2000 compliance tests, the objective of IV&V is to provide an assurance that all required activities and appropriate information were correctly used in producing the desired results.

### ***3.1.2 Step 1. Verify the Assessment Phase***

Assessment verification is the application of IV&V methods and techniques to review evaluate and provide a detailed analysis of the Assessment phase, specifically on the project products from this phase. There is also a need to analyze other inputs and ancillary information used during this phase, for example, applicable government regulations. IV&V activities to verify the assessment phase include:

- Review USDA policy and procedures for Y2K assessment
- Review applicable government regulations for Y2K assessment
- Verify assessment methodology and criteria
- Verify assessment tools and techniques
- Verify assessment process
- Verify assessment results

### ***3.1.3 Step 2. Verify that Change Requirements were Documented***

A result of the assessment phase is the determination that a system is Y2K non-compliant, and therefore it will require renovation to become compliant. Normally, a requirement for modification of the specific sub-systems, components, or individual software modules, will need to be written and documented for subsequent action.

### ***3.1.4 Step 3. Validate Program Logic Functionality***

Although, in general, the system change requirement will consist of implementing the date changes, there is a possibility that these changes could affect the program's logic or the handling of a particular program process. In this case, it would be required to apply further IV&V procedures to ensure that the resulting requirement specification is correct and will not result in detrimental changes to the overall system.

Other IV&V activities that may be applicable during the assessment phase are:

- Verify the system specification
- Verify the software requirements specification
- Verify the interface requirements specification
- Verify the software development plan
- Perform criticality and risk assessment of requirements
- Review user interface requirements
- Review input, output, and database requirements
- Review test requirements, planning and strategy

- Participate in all reviews and meetings that affect the project
- Produce problem reports

## 3.2 Renovation Verification

### 3.2.1 Design Specifications

The Y2K Renovation phase involves design, code (open application or embedded), microchip, and equipment verification on the modified systems. In the traditional system development life cycle, the IV&V activities look at the system design products in relationship to the system specifications. In some Y2K renovation efforts, a lot of the code is changed in automated fashion using Y2K conversion software that also implement other necessary program or logic changes, as a result of the date changes.

#### 3.2.2 Step 1. Verify Renovation Process

The IV&V activities will treat all code changes in terms of written or implied system or change specifications produced in the requirements or assessment phase. From the point of view of verifying the Y2K renovation phase, the IV&V analyst shall perform the following activities:

- Review USDA policy and procedures for Y2K renovation
- Review applicable government regulations for Y2K renovation
- Verify renovation methodology and criteria
- Verify renovation tools and techniques
- Verify renovation process
- Verify renovation results

#### 3.2.3 Step 2. Verify Design or Change Specifications

From the point of view of verifying the system design as a result of new or modified requirements, the IV&V analyst shall perform the following activities:

- Verify the software design document (SDD)
- Verify the interface design document
- Verify the requirement tracing into SDD
- Verify data flow
- Verify behavioral factors (specially real-time systems)
- Verify selected algorithms
- Verify database structures and elements
- Verify user interface



- Verify design risks
- Review sizing and memory allocations
- Review how well developer is following system development plan
- Participate in all reviews and meetings that affect the system
- Produce problem reports

### ***3.2.4 Step 3. Verify Code Changes and Documentation Updates***

Code verification involves the following IV&V activities:

- Verify consistency between code and SDD, or Product Specifications
- Verify that specified standards and practices are being followed
- Verify that developer is using specified coding tools
- Verify logical structure and syntax with static analysis
- Verify terms between data dictionary and code
- Verify sample input and output data
- Verify algorithms per SDD or Product Specifications
- Verify versions of computer, operating systems and utilities
- Review software library and release/version control
- Participate in all reviews and meetings that affect the project
- Produce problem reports

## **3.3 Code Validation**

### ***3.3.1 Validating Y2K Compliance***

The Validation phase in the Y2K IV&V program becomes perhaps the most critical one since it is here where it will be determine if a system is Y2K compliant or not. This phase is also more complex and requires greater management attention and resources than the previous phases. It involves the development of various levels of test plans, their implementation and management and concludes with the validation and certification of Y2K compliance for every tested system or component

### ***3.3.2 Step 1. IV&V Validation Activities***

The IV&V analyst performs the following activities to validate modified systems:

- Review and evaluate software and/or equipment test plan and test description for each system

- Evaluate developer's test program and select key-event tests for data collection and monitoring
- Monitor developer's testing
- Develop IV&V test strategy
- Define and configure the IV&V testbed
- Run independent validation tests
- Confirm validation of requirements to tests
- Validate software product specification
- Validate software user's and system operator's manuals
- Track Configuration Control Board actions and open-item status
- Participate in all reviews, audits, and meetings that affect the project
- Produce problem reports and monitor their correction

## 4.0 Operating Environment

This section addresses the selection of tools that are necessary to conduct an effective IV&V program, the support software that constitutes the systems environment required for verifying and validating compliance, and the facilities that will be assigned to the IV&V team to conduct its work.

### Areas within Operating Environment

- 4.1 Tools and Analysis Aids**
- 4.2 Support Software**
- 4.3 Facilities**

## 4.1 Tools and Analysis Aids

### 4.1.4 Underlying Selection Methods

There are two underlying methods for deciding which tools and techniques to use -error coverage and cost benefits. The focus on error coverage is on absolute equipment and software documentation correctness. On the cost benefits side, the application of the tool and the related benefits in cost savings or quality improvement is traded off against the operating and maintenance costs of the tool itself.

#### 4.1.3 Step 1. Select the Desired Tool Characteristics

For a general list of desired tool characteristics, the Mission Area and Agency shall consider the following:

- Maturity of the tool implementation which lowers the risk and costs of tool application
- Versatility, which allows for substitution or addition of elements or functions if there is a need to tailor the tool for a specific task.
- Familiarity, which depends on organization, available personnel, individual experience, training, and corporate commitment. Useful tools are generally intuitive in their application

- User friendly is a key attribute of IV&V tools since it makes its users feel competent and comfortable in its use.
- cost

#### ***4.1.2 Step 2. Develop the Criteria for Tools Selection***

Among the factors that will influence an IV&V tool set are the organization's operating environment, programming languages, software tools, equipment, and development methodologies. In general, direct experience with specific tools is most valuable in making a choice. Final selection of the IV&V tools should be in the hands of the IV&V team.

#### ***4.1.1 Step 3. Select the Tool(s)***

Make a listing of the tools and analysis aids selected for the IV&V effort. This list will be the result of a previous evaluation and selection process of available tools for each application by IV&V phase. It should include a tradeoff analysis to explain why certain tools were selected.

### **4.2 Support Environment**

#### ***4.2.1 Duplicate the Support Environment***

Normally, IV&V should have a duplicate version of the support environment for system evaluation. This includes application software (open application or embedded), being changed by the software development group, equipment being used by the telecommunications system, and vulnerable systems embedded chip machines or equipment in addition to other software required for IV&V work.

Typical support needed in the IV&V environment and/or testbed includes:

- Operating system and application software
- Compilers, cross-compiler
- Assembler
- Linker/loader
- Screen editor
- Contractor's data reduction software (if applicable)
- Debugging packages
- Any special installation and test software
- Any maintenance and diagnostic software
- Selected utilities

- Special IV&V data reduction software
- Configuration management and library software
- Any CASE tools that need to be shared
- Telecommunications equipment and operational software
- Embedded system software and hardware components
- All of the analysis tools, simulations, and any other non-application software that may be required to effectively perform the IV&V activities

### **4.3 Facilities**

#### **4.3.1 *Co-Located***

An important factor in IV&V planning is in the geographic location of the USDA systems facilities, the software development group, the telecommunications system development and test facility, and vulnerable systems equipment and the IV&V team. Isolation of the IV&V facility from the customer will likely result in greater expense in order to maintain all necessary material including a software and document library, test documentation, and computer facilities. Locating the IV&V team within the user's proximity means that IV&V and the user can share common item.

#### **4.3.2 *Separate Facility***

When required, a separate IV&V facility or lab test facility must be similar to the government facility where the project work is being performed. Most advantageous and least costly to the Mission Area or Agency will be to arrange for the contractor to use government-furnished equipment and facilities. Otherwise schedules and plans for hardware and software acquisitions that will be required to complete the facility to be used for IV&V purposes will be necessary.

An alternative is to use the contractor's facilities and provide government-furnished equipment, IV&V and test tools to duplicate the operational environment.

## 5.0 IV&V Configuration Management

This section describes the configuration management requirement to keep control of system product versions and changes. It also addresses the interface to quality assurance and how IV&V must itself follow the QA procedures. Finally, the guide defines the basic principles for structuring the IV&V staff and provides general guidelines for selecting the appropriate personnel.

### Areas within IV&V Management

- 5.1 Configuration Management**
- 5.2 Software Quality Assurance**
- 5.3 Staff and Organization**

## 5.1 Configuration Management

### 5.1.1 *Develop a Standard Configuration Control Process*

It is generally acceptable to copy the software developer's configuration management and control procedures, or to use IV&V's own methods provided that they use standard configuration identification, accounting and control procedures, and the status codes are compatible with the client's system CM procedures. This will ensure adequate configuration control of the delivered software products after the development or conversion efforts are completed. This section should also describe the CM interfaces, Configuration Control Boards, and the operation of the libraries and configuration status accounting system.

## 5.2 Software Quality Assurance

### 5.2.1 *Step 1. Define the Interface with Developer's SQA*

Describes the interface with the software developer's quality assurance group. This enables IV&V to share test results, results of reviews and audits and product evaluations, and other QA actions.

### **5.2.2 Step 2. Review of Developer's SQA Procedures**

Include a detailed description of how IV&V intends to perform IV&V activities on the contractor's software quality assurance planning and how recommendations will be made to correct deficiencies in the developer's SQA procedures.

### **5.2.3 Step 3. Application of SQA to IV&V's Products**

State how IV&V intends to perform SQA on its own products that are deliverables on the contract, to ensure that required quality considerations are met.

## **5.3 Staff and Organization**

### **5.3.1 Functional Staff**

In conforming the IV&V team, the team manager needs to analyze the functional area(s) that are served by the project being developed or modified. For example, for a human resource management project the IV&V team should include an HR specialist to assure that the system definition, design and implementation addresses the requirement and functionality to provide the required HR services to the organization. For large and complex projects it is recommended that the IV&V team be staffed with specialists in each of the major functional areas, i.e., benefits, retirement, insurance, etc. The exact number of analysts and their role is a function of project size, time constraints, budget, and availability of qualified personnel.

### **5.3.2 Technical Staff**

The IV&V team will also include IV&V and systems analysts who are experienced and knowledgeable of IV&V methodologies, activities and practices, and who will be responsible for assessing system integration and performance.

A sub-group or an individual within the technical staff will be responsible for developing and/or integrating IV&V software, systems, and tools. This individual will also define, adapt and implement the required methodologies, techniques, documentation, plans and practices.

### ***5.3.3 Support Personnel***

IV&V support personnel will cover administration and coordination of the software library, configuration management, computer facility, technical writing, and clerical support.

### ***5.3.4 Management Hierarchy***

The management hierarchy should be simple and straight-line to ensure a short path to the Mission Area Senior Executive and each Agency Administrator. This type of organization will help in getting the required senior staff commitment for successful performance.

### ***5.3.5 Selection of the IV&V Manager***

The selection of the IV&V manager should be based on direct IV&V experience, knowledge and ability to discuss project technical aspects, knowledge of IV&V methodologies, tools and techniques, and ability to work in government environments. The manager should also be able to communicate with the system developer and the client about system deficiencies and issues.



## APPENDIX A

### Glossary

The following list of words may have special meaning in the context of the Year 2000 project.

<b>Calendar errors</b>	Errors typically include failing to treat 2000 as a leap year and converting incorrectly between date representations.
<b>Cluster</b>	A cluster is composed of multiple systems that constitute a complete process.
<b>Combined Component</b>	Any stand-alone, computer-based, commercial off-the-shelf device or software package that has two or more date/time functions that can affect test results.
<b>Compliance</b>	Year 2000 compliance means that neither performance nor functionality is affected by dates prior to, during and after Year 2000. Compliance will be demonstrated when the criteria of General, date, and century integrity are satisfied.
<b>Component</b>	Any stand-alone, computer-based, commercial off-the-shelf device or software package that has only one date/time function that can affect test results. The smallest unit of testing for the Year 2000 project.
<b>Cross Cluster Testing</b>	The highest level of integration testing which is organized around a particular function or across functions. An example is a product order through product delivery.
<b>Date integrity</b>	All manipulations of calendar-related data (dates, duration, days of week) will produce desired results for all valid date values within the application.
<b>Date overflow</b>	Many software products represent dates internally as a base date/time plus an offset in days, seconds,

	or microseconds since that base date/time. Hardware integers holding the offset value can overflow past the maximum corresponding date—an event, which may lead to, undefined behaviors.
<b>Explicit first 2 digits of year</b>	Date elements in interfaces and data storage permit specifying the first 2 digits of the year to eliminate date ambiguity.
<b>Extended semantics</b>	In general, specific values for a date field is reserved for special interpretation. The most common example is interpreting "99" in a 2-digit year field as an indefinite end date, i.e., "does not expire." Another is embedding a date value in a non-date data element.
<b>First 2 digits of year ambiguity</b>	This is the most common element. Software represents dates with a 1- or 2-digit year. When software does not recognize that dates are not all in the 19xx range, the results are undesirable.
<b>General integrity</b>	No value for current date will cause interruptions in normal operation.
<b>Gregorian Calendar</b>	Revision of the Julian calendar in 1582 by Pope Gregory XIII, adopted by the US and Great Britain in 1752. Added that centesimal leap years must be divisible by 400 rule and suppressed 10 or 11 days during 1700.
<b>Inconsistent semantics</b>	At interface between systems, software on each side assumes semantics of data passed. Software must make same first 2 digits of date assumptions about 2-digit years.
<b>Independent</b>	An entity that is free, separate and autonomous from the influence, guidance or control of the Agency or Development Contractor.
<b>Independent Verification &amp; Validation</b>	The process of an entity verifying and validating findings of another entity while staying completely neutral as to the outcome of the process.
<b>Julian Calendar</b>	Introduced in Rome in 46 B.C., it established a 12

month year of 365 days with every 4th year having 366 days.

**Julian Date**

Julian Date (JD) is the number of days since Noon 4713 BC plus the fractional part of a day for the time of day past Noon.

**Modified Julian Date**

Number of days to 5 digits and shifted the beginning of the time of day to Midnight. For 1997, the MJD is 50448 + DOY (day of year).

**Modified Julian Date**

(MJD) is the Julian Date minus 2,400,000.5 which reduced the size of the Real-time Clock A battery operated clock which keeps time when the system is powered off Virtual Clock. A software based clock used in some operating systems to maintain the time and date as an operating system service.

**System**

A system is composed of multiple combined components and/or components that form part of a operating process, i.e. pay roll program, Production Cell.

**Test plan**

A test plan is a documented set of test cases and test scripts.

**Test case**

A test case is a documented test procedure with specific input data and expected test results. Example - rollover Dec 31, 1999

**Test procedure**

A test procedure is a step by step description of the test to be performed. Example – rollover

**Unit**

A Unit is the minimum recognizable level to which equipment containing a date/time function or processor can be broken down. The Inventory will be composed of multiple Units.

**Validation**

The process of evaluating software at the end of its development to insure that it is free from failures and complies with the stated requirements, standards and design. A failure is defined as incorrect product behavior. Often this validation occurs through the utilization of various testing approaches. Other intermediate products may also

be validated, such as the requirement description, which is validated through the utilization of a prototype. Validation also involves hardware and project assessment of the product baseline at the system and subsystem levels.

**Verification**

The process of evaluating a project, component, document, or process to determine whether or not products of a given development phase are complete, correct, and meet all requirements established during the previous phase. Verification involves evaluation, analysis and testing at each level of design and development as well as traceability of the requirements to the previous level in the development cycle. Verification provides early exposure of requirements inconsistencies, design errors, and strategic and technical risks, thereby improving the quality of the final product.

**Year 2000 Ready**

There will be no impact on production nor product quality due to Year 2000 date issues, but compliance is NOT required.

## APPENDIX B

### Independent Verification and Validation Request Form

#### *Instructions*

Complete the *IV&V Request Form* by following the instructions below. Upon initial completion of the form, your Executive Sponsor must sign and date the form prior to submission to the Year 2000 Program Office. The form may be faxed to the Program Office at (202) 205-3755, or delivered to the Year 2000 Program Office located in 0034-S.

The Year 2000 Program Office will review and document the request upon receipt. Upon approval, the Year 2000 Program Office will fax the original form back to the Agency.

After completing the requested IV&V, the Agency must complete items 9-11 and submit the form to the Year 2000 Program Office.

Block #	Instructions
1.	Type in the name of the Agency that this request is for.
2.	Type in the name of the Executive Sponsor for the Agency specified in block 1.
3.	Type in the date that this form is being submitted.
4.	Type in the name of the system that this request is referring to.
5.	Type in the specific business function of the specified system.
6.	Type in the estimated cost of the IV&V effort.
7.	Type in the estimated start date of the IV&V effort.
8.	Type in the estimated completion date of the IV&V effort.
9.	Type in the actual cost of the IV&V effort.
10.	Type in the actual start date of the IV&V effort.
11.	Type in the actual completion date of the IV&V effort.

**Department of Agriculture  
Office of the Chief Information Officer  
Year 2000 Program Office**

**Independent Verification and Validation Request Form**

<b>1</b>	<b>Agency Name</b>	
<b>2</b>	<b>Executive Sponsor's Name</b>	
<b>3</b>	<b>Date Submitted</b>	
<b>4</b>	<b>Name of System</b>	
<b>5</b>	<b>System Business Function</b>	
<b>6</b>	<b>Estimated Cost of IV&amp;V Effort</b>	
<b>7</b>	<b>Estimated Start Date</b>	
<b>8</b>	<b>Estimated Completion Date</b>	
<b>9</b>	<b>Actual Cost of IV&amp;V Effort</b>	
<b>10</b>	<b>Actual Start Date</b>	
<b>11</b>	<b>Actual Completion Date</b>	

***Signatures:***

Executive Sponsor \_\_\_\_\_ Date \_\_\_\_\_

Contact Person \_\_\_\_\_ Phone \_\_\_\_\_ Fax \_\_\_\_\_

Year 2000 Program Office \_\_\_\_\_ Date \_\_\_\_\_

***Comments:***

## **APPENDIX C**

### **Sample IV&V Statements of Work (SOW)**

**Statement of Work  
Independent Verification and Validation  
of Washington Headquarters Complex  
USDA Year 2000 Program Office**

## **1.0 INTRODUCTION**

### **1.1 Authorities**

Work will be performed for the Chief Information Officer (CIO), Office of Chief Information Officer (OCIO), U.S. Department of Agriculture, under the authority of the Executive Order on Year 2000 Conversion (issued February 4, 1998) and the OCIO Advisory and Assistance Service approval for Independent Verification and Validation (IV&V) of Department of Agriculture agencies Year 2000 projects and programs (approved February 13, 1998).

### **1.2 Benefits**

Work performed will be for the benefit of all USDA agencies located in the Washington Headquarters buildings and facilities, and Departmental Administration Year 2000 program and project. Work will assist the Chief Information Officer in selecting appropriate courses of action, identifying risks and opportunities, problems and risks, and proposing workable solutions.

### **1.3 Background**

The United States Department of Agriculture (USDA) is now engaged in an intensive effort to ensure that its buildings and facilities infrastructure systems are not vulnerable to the Year 2000 date change. Of primary importance to the Department is the impact of the Year 2000 issue on building and facilities mission critical systems on program delivery. Therefore, efforts must be prioritized to ensure that neither the Department nor the public is at risk within the buildings and facilities.

USDA has much at stake in the development, implementation and management of vulnerable systems and processes (buildings, facilities, personal property, and scientific and laboratory equipment) for the Year 2000 Program. The CIO recognizes the mission critical importance of this activity and has a strong desire to ensure that USDA building and facilities critical systems are Year 2000 compliant by March 1999.

The Washington Headquarters Complex, which covers the Whitten Building, South Building, Auditors Building, Cotton Annex, and the new Beltsville Office Facility, has been reported certified Year 2000 compliant by the Office of Operations. Therefore, OCIO requires the services of a contractor who will develop a plan for an independent verification and validation of the Washington Headquarters Complex buildings and facility as proof-positive that the Complex components are Year 2000 compliant as certified.



## **1.4 Objectives**

The IV&V contractor's role will be to review any relevant documentation to provide assessments of the quality, accuracy, and appropriateness of those items certified Year 2000 compliant. Reviews of plans and other management materials and documentation, as well as technical analyses and evaluations, will be used to validate approaches and verify that the plans and designs for projects are providing reasonable solutions.

The contractor shall assess and evaluate documentation on the level of compliance with the guidance on Year 2000 provided by the Department, Congress, the Office of Management and Budget (OMB), and the General Accounting Office (GAO). Also, the Office of Operations, Washington Area Service Center, documentation should be evaluated for completeness, clarity, consistency, and feasibility. Evaluations should be based on information gathered, selected appropriate criteria for assessments, and questions such as:

- Are objectives sufficiently defined?
- How thorough is the analysis?
- Have appropriate reviews and assessment been conducted to validate accuracy for Year 2000 readiness?
- Are the correct solutions being proposed?
- Are the time lines realistic?
- Have adequate test mechanisms been included in the plans?
- Do personnel involved with the internal certification of the Complex building systems have the appropriate skill levels necessary for assessing compliance of the embedded systems?

The contractor shall develop a plan outlining specific actions required to verify compliance of Year 2000 embedded components at USDA Washington Headquarters Complex. Recommendations for improvements or alternative courses of action which could be taken and are more cost effective, timely or better able to meet user needs should also be included.

## **1.5 Scope**

The scope of this statement of work includes activities to assist the CIO in the oversight of Year 2000 remediation. Products produced in this statement of work will:

- Use and follow sound Independent Verification and Validation (IV&V) methodologies;
- and, be supported by internal and external documentation and research materials where appropriate.

Contractor support is required for the following:

- assessment of the quality of the studies conducted;

- developing a baseline plan for testing and verification;
- verification that the planning and assessment phase is well-thought out, error-free, and meets the criteria for all buildings and facilities IV&V for Year 2000 remediation;
- the IV&V process requires proper documentation for all phases of the process. It is beneficial for all USDA agencies to have standardized documentation of activities involved in testing and verifying building and facilities infrastructure systems for Year 2000 remediation.

#### **1.6 Period of Performance**

Work is expected to begin in July 1998 and be completed by August 1998.

#### **1.7 Contract Type**

The efforts required shall be conducted on a Firm Fixed Price basis.

### **2.0 TECHNICAL SERVICES REQUIRED**

#### **Planning and Assessment--**

**develop plan and schedule of deliverables for verification and validation of the Washington Headquarters Complex buildings and facility systems requiring IV&V**

The contractor shall review the major tasks, identify those which are candidates for IV&V, and create a plan for conducting IV&V studies. The primary sources of information will be the building blue prints, surveys, and interviews with project managers, engineers, and the Year 2000 Program Office.

#### **2.1 Deliverables**

- Plan outline of specific activities for IV&V
- Kick-off meeting with USDA representatives
- Walk-through survey of the Washington Headquarters Complex
- Assessment of survey
- Report identifying the plus and minus to assessment based on documentation, interviews, surveys, blue prints, and critical systems, with solutions, alternatives, and options
- Identification of the resources needed to complete IV&V tasks
- Identification of proposed time schedules for completing IV&V
- Actual testing and validating systems to verify Year 2000 readiness.
- Estimated costs for completing the IV&V
- Labor categories required for the IV&V

All deliverables shall be submitted in accordance with the following requirements:

- Reports should be in Word Perfect 6.0/6.1 format unless otherwise agreed upon by the contractor and the CO.
- The Government shall have 5 working days in which to review deliverables and provide comments to the contractor.
- The contractor shall have 5 working days in which to incorporate the Government's comments into the deliverables.
- Draft reports shall be in electronic format (either 3 1/2" diskette or sent by electronic mail).
- Final reports shall be in electronic format (either 3 1/2" diskette or sent by electronic mail). Five bound printed copies are also required.
- All deliverables shall be submitted to the Contracting Officer. Documents sent by electronic means shall also be addressed to the COTR

## **2.2 Acceptance**

The contractor will ensure that the services provided support the Government's requirements. The Contractor will perform all services under this task in a competent and diligent manner. The Contractor is responsible for ensuring that the services provided to the Government are at acceptable quality levels. All work will be reviewed and evaluated as to:

- completeness,
- use of information acquired from research and interviews,
- thoughtfulness of analysis, and
- thoroughness of responses to issues raised.

## **2.3 Required Travel**

No travel is anticipated for this statement of work.

## **2.4 Government Furnished Resources**

The Government will provide the facilities to conduct interviews, work sessions and status briefings, as appropriate. Any special or unique resources to be furnished by the Government will be negotiated with the contractor and must be requested in writing.

## **2.5 Documentation**

The Government will provide copies of:

- Assessment and Certification Report,
- Methodology used for the Assessment,
- Inventory of equipment,
- Vendors that provide goods, services and equipment to GSA

### **3.0 ADMINISTRATIVE CONSIDERATIONS**

#### **3.1 Points of Contact**

The Contracting Officer (CO) is Michael McFarland. His telephone number is 202-720-4179. His fax number is 202-720-4529. His electronic mail address is michael.mcfarland@usda.gov.

The Contracting Officers Technical Representative (COTR) is Evelyn Davis. Her telephone number is 202-720-2522. Her fax number is 202-205-3755. Her electronic mail address is Evelyn\_d.davis@usda.gov

#### **3.2 Place of Performance**

The work shall be performed primarily at an off-site location to be furnished by the Contractor. As necessary and for the benefit of the Government, the Government will provide the facilities to conduct interviews, work sessions and status briefings. No special or unique resources will be furnished by the Government unless specified herein.

#### **3.3 Hours of Work**

The Government furnished resources will be available during normal duty hours (generally 7:30 a.m. to 4:30 p.m., Monday through Friday). Availability of Government furnished resources outside of the normal duty hours is subject to the approval of the COTR.

### **4.0 CONFIDENTIALITY**

Confidential information may be presented to the contractor for inclusion in their efforts. This would include information of data submitted by, or pertaining to, an institution or organization. This information may require special consideration with regard to the timing of its disclosure.

The contractor is required to maintain confidentiality on all specific information, or categories of information, which the government representative indicates must remain confidential, or which the contractor feels must remain confidential. As such, confidential information must not be disclosed without the prior written consent of the government.

The contractor must agree to keep all information contained in source documents, or any other media, furnished by the Government in the strictest of confidence. The contractor must take all reasonable measures to restrict access to this material to those employees needing the information to perform the work required by this SOW.

The following Federal Acquisition Regulation clauses are incorporated by reference, with the same full force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available:

- |          |                                     |
|----------|-------------------------------------|
| 52.224-1 | PRIVACY ACT NOTIFICATION (APR 1984) |
| 52.224-2 | PRIVACY ACT (APR 1984)              |

## **5.0 OTHER PERTINENT INFORMATION OR SPECIAL CONSIDERATIONS**

### **5.1 General/Miscellaneous**

A Contracting Officer's Technical Representative (COTR) will be appointed and will act as the principle government point of contact with the contractor.

### **5.2 Unique Reporting Requirements**

The contractor is required to report biweekly, in writing, to the Contracting Officer and COTR. The written report will describe the activities performed during the reporting period and any variances to the plan. Any problems and unresolved issues will also be included. The report should be in Word Perfect 6.0/6.1 format unless otherwise agreed upon by the contractor and the COTR, and sent by electronic mail.

During the execution of assignments, the contractor must conduct, at the Government's request, biweekly meetings between contractor personnel and key Government personnel to discuss issues and planned activities. These meetings will take place at the OCIO's office or such place as designated by the OCIO.

### **5.3 Key Personnel**

To ensure the continuity of the task being performed, the contractor must specifically propose key personnel whose services are to be provided, as required, for the duration of the task order. Key personnel can only be removed from the project through prior written approval from the CO or upon the key personnel's resignation from the contractor's employment. The contractor shall submit résumés for all personnel proposed for work under the task orders.

### **5.4 Use of Subcontractors**

If subcontractors are to be used, the contractor's proposal must include plans for their use. Subcontractors must be identified and résumés of personnel to be used must be provided.

**Statement of Work**  
**Independent Verification and Validation of the**  
**Risk Management Agency's**  
**Application Platform Replacement (APR) Project**

**1.0 INTRODUCTION**

**1.1 Organization, Authorities and Benefits**

Work will be performed for the Office of the Chief Information Officer (OCIO), U.S. Department of Agriculture, under the authority of the Clinger-Cohen Act of 1996 (40 USC 1401 et seq).

Work performed will be for the benefit of USDA information resources management and Risk Management Agency programs and functions, both at the Departmental level and at the individual agency level.

**1.2 Background**

The Risk Management Agency (RMA) provides and supports cost-effective means of managing risks for agriculture producers in order to improve the economic stability of agriculture. RMA was established under provisions of the Federal Agriculture Improvement and Reform Act of 1996, Public Law (PL) 104-127, signed April 4, 1996. This act amended the Department of Agriculture Reorganization Act of 1994, PL 103-354, Title II, to require the Secretary to establish within the Department an independent office responsible for supervision of the Federal Crop Insurance Corporation, administration and oversight of programs authorized under the Federal Crop Insurance Act (7 U.S.C. 1501 et. seq.), any pilot or other programs involving revenue insurance, risk management education, risk management savings accounts, or the use of the futures market to manage risk and support farm income that may be established under the Federal Crop Insurance Act or other law; and such other programs the Secretary considers appropriate.

RMA is committed to transforming the crop insurance program into a broad-based safety net for producers to assure that American agriculture remains solid, solvent, and globally competitive into the 21st century. This safety net for producers consists of many public and private alternatives designed to improve the economic stability of agriculture. RMA's portion of the safety net is supported by the products and/or tools mentioned above. RMA's 3 principal products and/or tools are: a) Federal Crop Insurance; b) Revenue Insurance; c) Risk Management Education.

Traditionally, RMA has processed its information on departmental mainframe computers. The RMA has initiated the Application Platform Replacement (APR) project to migrate its legacy systems to a client/server environment, in part to deal with Year 2000 problems. This replacement strategy means that RMA programs

are at risk if systems are not deployed and operational on time.

### **1.3 Objectives**

The objective of this Statement of Work (SOW) is to perform an independent verification and validation (IV&V) of RMA activities in the management and implementation of the APR migration. The focus will be on management structures, transition goals, the strategies to meet these goals, how RMA may best meet them, and include an assessment of risks.

The IV&V Contractor's role will be to review APR plans, documentation and products of APR implementation and contingency planning. A project management review is also requested to include an assessment of APR cost, schedule and performance activities, and the ability of RMA to maintain its deployment schedule. The goal of these reviews is to validate current approaches and verify that the plans and designs for the project are consistent with current Departmental guidance, RMA program requirements and Year 2000 goals. To the extent that analysis reveals gaps in performance, recommendations for improvements and alternative courses of action will also be required. The contract scope will include, but is not limited to, analyses of:

- ▶ Project Management and planning process;
- ▶ Project staffing and reporting;
- ▶ Project cost estimation;
- ▶ Evaluation methodologies;
- ▶ Internal and external coordination and communications;
- ▶ Contingency and testing plans, methodologies and strategies covering all phases of APR implementation.

Questions which the CIO desires to be answered include:

- ▶ Are the project plans and management structures appropriate, given the scope of this project?
- ▶ Are there any factors which would impede successful implementation of the APR?
- ▶ What contingency plans have been developed in case planned replacements for existing applications or hardware are not delivered or operational on time?
- ▶ How are the most critical non-Year 2000-compliant aspects of the systems prioritized and what plans and schedules are in place to address their compliance?
- ▶ What is the project management approach to the Year 2000 problem? Is the implementation schedule realistic and are the costs fully defined?

### **1.4 Scope**

The scope of this contract shall include the review and assessment of the Application Platform Replacement as discussed in 1.3 Objectives . This will

include the program's goals, objectives, strategies, supporting organization and staffing.

The Contractor shall make recommendations for improvements to the areas and questions listed in 1.3 Objectives which will maximize opportunities for successful achievement of the goals and objectives of APR. The findings and recommendations shall include the Contractor's assessment of the potential impacts to the APR program's cost, schedule and performance objectives.

### **1.5 Period of Performance**

The final report shall be finished within forty five (45) calendar days of contract award.

## **2.0 TASK ORDER DELIVERABLES**

### **2.1 Deliverable Descriptions**

#### **Task 1: Response to this Work Order**

The prospective Contractor will prepare a proposal within two weeks of receipt of this SOW. The proposal will include the following: Understanding of the project requirements, including goals and objectives; definition of work to be performed, including areas to be studied, significant milestones, appropriate assessment criteria, project work plan, including proposed time frame and hours required; proposed staffing, including relevant experience from experience in comparable projects; project deliverables; and project cost. Proposals will be evaluated according to the criteria in section 6.0.

#### **Task 2: Orientation Meeting**

The Contractor shall meet with representatives of the OCIO and RMA to discuss the scope of the tasks and timetable for completion. This meeting will establish a working relationship with the Contractor and the Government. In addition to the information already provided, this meeting will acquaint the Contractor with issues surrounding the review, attempt to answer and clarify questions the Contractor may have, and provide the Contractor with further guidance needed to perform the review. As a result of this meeting, the Contractor will finalize the project work plan.

#### **Task 3: Collect Program Information/Document Current Environment**

The Contractor shall collect and review information on APR. Interviews shall be conducted with USDA personnel involved with the project and its contractor.

#### **Task 4: Perform Analysis and Evaluation**

The Contractor shall analyze the baseline data collected and evaluate and identify areas which are functioning well and areas where improvement is needed. Where appropriate, determine, if possible, the reasons for the performance shortfalls.

#### **Task 5: Develop and Make Recommendations**



The Contractor shall develop and report recommendations for management improvement opportunities which were identified. Impacts to other programs of USDA should also be discussed.

**Task 6: Final Report**

The Contractor shall submit a draft final report which includes the final versions of the previous tasks. OCIO and RMA comments on the draft final report provided to the Contractor shall be considered for incorporation into the final report. The Contractor shall orally brief the CIO and the RMA or their designees, on the draft and final reports.

**2.2 Schedule/Duration**

Any changes to the following schedule or duration of tasks will be submitted in writing, along with reasons for needed change, to the COTR. No changes in schedules or durations will be considered or accepted, unless the COTR agrees to, and signs off on, all change documentation.

**Task 1: Response to this Work Order**

Respond within 2 weeks of receiving this SOW, with a proposal as specified in section 2.1.

**Task 2: Orientation Meeting**

The orientation meeting will be held within two working days of contract award.

**Task 3: Collect Program Information/Document Current Environment**

The Government will furnish as much documentation at the orientation meeting as possible in order to minimize the data collection time. Scheduling of the completion of this task shall be at the discretion of the Contractor.

**Task 4: Perform Analysis and Evaluation**

Scheduling of the completion of this task shall be at the discretion of the Contractor, dependent on the information collected during Task 3, and subject to the deliverable schedule of Task 5.

**Task 5: Develop and Make Recommendations**

The draft final report which includes initial findings and recommendations for improvement is due within thirty five (35) calendar days of contract award. The Government will have four working days to make comments and provide these comments to the Contractor.

**Task 6: Final Report**

The final report is due on day forty five of the contract. The Contractor will consider Government comments in finalizing the report to the CIO and RMA.

### **2.3 Task Order Required Expertise**

This task requires personnel with high levels of expertise in large-project management, organization management, internal/management controls, system design and development, commercial-off-the-shelf systems, evaluation of systems, project management, cost estimation, and development of customer requirements.

### **2.4 Task Order Required Travel**

Work under this task order is anticipated to be conducted in the Washington, D.C. metropolitan area. Any travel outside of the Washington, D.C. area by the Contractor will be reimbursed by the Government for travel and per diem expenses in accordance with Government travel regulations. All travel must be approved and funded in advance by the Contractor's project manager and the COTR.

### **2.5 Government Furnished Resources**

#### **2.5.1 Facilities, Supplies and Services**

As necessary and for the benefit of the Government, the Government will provide the facilities to conduct interviews, work sessions, and status briefings. Any special or unique resources to be furnished by the Government beyond facilities for work sessions or briefings must be specifically requested in writing by the Contractor and approved by the COTR.

#### **2.5.2 Documentation**

The Government will provide copies of all applicable previous studies, plans, publications and other pertinent documents (such as those which address Department and Agency strategies/directions regarding Year 2000 remediation) as needed for this task order.

### **2.6 Other Information**

The Office of the Chief Information Officer will manage this contact and appoint the Contracting Officer's Technical Representative (COTR) from the OCIO staff.

The Contractor's proposal for completion of this task order will include a project plan detailing the specific milestones, dates, and costs related to each of the tasks of this task order which will be approved by the COTR.

Progress reports will be required every two weeks. These progress reports should contain, at a minimum, tasks being worked on, percent completion of tasks with relationship to task work description and time allotted, and a bulleted list of any issues identified within the reporting period. The bulleted list should include a brief description of issues.

The draft final reports will be provided to the CIO, RMA and CO both in hard copy and electronic format. Hard copy for the final report shall be bound and include one (1) original and ten (10) copies. The electronic version will be presented on a 3.5" diskette in WordPerfect format unless other arrangements are agreed to by the COTR and the Contractor.

### **3.0 ADMINISTRATIVE CONSIDERATIONS**

#### **3.1 Place of Performance**

Unless otherwise specified in the task order, the work will be performed primarily at an off-site location to be furnished by the Contractor. At the Contractor's request, work space may be provided by the Government in the Washington, D. C. area.

#### **3.2 Hours of Work**

Government furnished resources will be available during normal duty hours (7:30 a.m. to 4:30 p.m., Monday through Friday). Availability of Government furnished resources outside of the normal duty hours is subject to the approval of the supervisor in charge.

### **4.0 CONFIDENTIALITY**

Confidential information may be presented to the Contractor for inclusion in their efforts. This would include information or data submitted by, or pertaining to, an institution or organization. This information may require special consideration with regard to the timing of its disclosure.

The Contractor is required to maintain confidentiality on all specific information, or categories of information, which the COTR indicates must remain confidential, or which the Contractor feels must remain confidential. As such, confidential information must not be disclosed without the prior written consent of the Government

The Contractor must agree to keep all information contained in source documents, or any other media, furnished by the Government in the strictest of confidence. The Contractor must take all reasonable measures to restrict access to this material to those employees needing the information to perform the work required by this SOW.

The following clauses are incorporated by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

- |          |                                     |
|----------|-------------------------------------|
| 52.224-1 | PRIVACY ACT NOTIFICATION (APR 1984) |
| 52.224-2 | PRIVACY ACT (APR 1984)              |

## **5.0 SPECIAL INSTRUCTIONS**

### **5.1 Unique Reporting Requirements**

The Contractor is required to report every two weeks, in writing, to the COTR and CO using the format described in Section 2.6.

The Contractor must conduct, at the Government's request, an oral presentation of the draft and final report to the CIO and the RMA.

### **5.2 Liquidated Damages**

Liquidated Damages are not applicable to this SOW.

## **6.0 EVALUATION CRITERIA**

Proposals will be evaluated per the following criteria:

1. Understanding the project requirements.
2. Understanding of the work to be performed, including work plan and time proposed.
3. Qualifications of proposed staff and organization to accomplish work, focusing on relevant experience with implementing systems.
4. Cost to complete the work.



## **APPENDIX D**

### **USDA IV&V Support Material**



United States  
Department of  
Agriculture

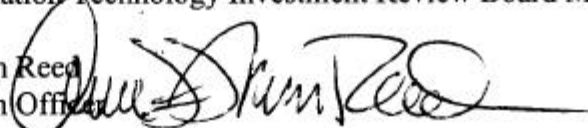
MAY 18 1998

Office of the Chief  
Information Officer

1400 Independence  
Avenue SW

Washington, DC  
20250

TO: Executive Information Technology Investment Review Board Members

FROM: Anne F. Thomson Reed  
Chief Information Officer 

SUBJECT: USDA Independent Verification and Validation Program

In fiscal year 1997, the Office of the Chief Information Officer embarked on a department-level Independent Verification and Validation (IV&V) program to establish greater accountability in the acquisition, implementation and management of USDA's information technology (IT) resources. The purpose of this program is to conduct unbiased reviews and analyses of IT plans, management approaches, requirements, technical alternatives and cost-benefit studies, and make any changes which can improve our usage of IT and information resources.

In our experience over the last year, we have found that these independent reviews assist us in identifying strengths and weaknesses, requirements which we did not consider, and alternative courses of actions which have helped us to maximize benefits and minimize risks. The results of these reviews have allowed us to make mid-course corrections, keeping IT projects on the proper track, and assuring that resources are positioned as wisely as possible.

We feel that IV&V is a logical part of project management, and are encouraged by the benefits which we have seen, and expect to continue to see, as IV&V becomes an integral part of USDA IT projects. We also feel that the inclusion of IV&V in the management of these projects will ease the project manager's burden by identifying potential problems before they happen and will preclude the intervention of internal or external oversight bodies.

The attached document describes the USDA IV&V process. We look forward to working with agency CIOs and senior information resources managers in conducting IV&V efforts. Any questions about the program may be directed to Marilyn Holland, Acting Chief, Program, Planning and Management Division. Marilyn may be reached at (202) 720-6330.

Attachment

**Office of the Chief Information Officer  
USDA Independent Verification and Validation Program**

**BACKGROUND**

In fiscal year 1997, the Office of the Chief Information Officer (OCIO) embarked on a department-level Independent Verification and Validation (IV&V) program to establish greater accountability in the acquisition, implementation and management of USDA's information technology (IT) resources.

The IV&V program helps OCIO meet the requirements of Section 5122 of the Clinger Cohen Act, which directs federal agencies to "design and implement [...] a process for maximizing the value and assessing and managing the risks of the information technology acquisitions of the executive agency" and to "provide the means for senior management personnel [...] to obtain timely information regarding the progress of an investment in an information system, including a system of milestones for measuring progress, on an independently verifiable basis, in terms of cost, capability of the system to meet specified requirements, timeliness, and quality."

**BENEFITS OF IV&V**

IV&V tasks will complement the agency's internal quality assurance and verification and validation processes. IV&V results will help managers ensure the quality and appropriateness of IT investments. The IV&V effort will provide an agency with:

- ◆ independent assessments of the quality of plans, documentation, and products of its IT activities;
- ◆ verification that the plans and designs for projects are providing solutions to real problems;
- ◆ validation of IT directions and approaches;
- ◆ higher success rates for projects, more efficient use of resources, and more effective program delivery to USDA customers. Projects, including acquisition projects, will be managed consistently across USDA;
- ◆ avoidance of cost overruns and delays;
- ◆ an institutionalized process for verification and validation.

Our recent experience has shown that IV&V will:

- ◆ assess how well information technology solutions, modernized processes and system designs address the needs of USDA customers;
- ◆ verify that the systems being built are well-designed, consistent with USDA architectures, and effectively integrated with existing Departmental technologies;

- ◆ validate the costs and benefits cited in the business case for USDA IT initiatives;
- ◆ assure the appropriate development and execution of project implementation plans throughout the system life cycle consistent with OMB guidance.

#### **IV&V PROGRAM MANAGEMENT & PROCEDURES**

OCIO will have overall responsibility for coordinating the IV&V program so that operating procedures will be the same across the Department. Central IV&V control ensures that adequate provisions for incorporating Departmental goals and processes have been incorporated in the design and development of agency IT initiatives.

The OCIO staff will work with agency representatives to write statements of work whose objective is to acquire contractor assistance to perform IV&V assessments, reviews and analyses of IT program activities, including planning and management activities covering the entire life cycle of IT systems. The OCIO will work with the Office of Operations to negotiate and administer IV&V contracts. To the extent possible, existing contract vehicles will be used.

OCIO shall assign a staff member to act as the contracting Officer's Technical Representative (COTR) for each IV&V contract or task. Appropriate OCIO staff members will participate with the agency in defining requirements, participating in meetings and reviews, and advising the agency on accepting or rejecting deliverables.

#### **Reporting**

As IV&Vs are completed, a report of major findings and a summary of recommended actions will be forwarded to each member of the Board.



TO: Agency Heads

FROM: Anne F. Thomson Reed  
Chief Information Officer

SUBJECT: Year 2000 Independent Verification and Validation (IV&V)  
Approval and Certification

As you know, less than two years remain before the year 2000. Within this timeframe, USDA must ensure all mission-critical systems will function effectively at the transition. IV&V is a vehicle that can be used to assist in this effort. Congress, the Office of Management and Budget and the General Accounting Office have all recommended that federal agencies use an independent source to verify system changes and processes. As a focal point for the Department's Year 2000 initiative, I am recommending that each agency consider this as an opportunity to review and validate mission critical systems.

On February 13, 1998, the Office of the Assistant Secretary for Administration gave approval to the Office of the Chief Information Officer (OCIO) to authorize advisory and assistance services for IV&V for Departmental agencies' Year 2000 projects and programs. This approval covers a two-year period with an estimated contract cost of \$7.5 million. The Year 2000 Program Office has established a process and format for IV&V approval (Attachment A).

As each agency completes the final phases of validation and prepares for implementation of systems, signed certification statements are required. Agencies will certify to OCIO that systems have been assessed and are Year 2000 compliant. The certificate of Year 2000 compliance (Attachment B) is to be provided to the Year 2000 Program Office as the compliant system begins implementation.

Thank you for your continued support and effort on this major initiative. If you have any questions, feel free to contact Gregory Parham, Executive Director for the Year 2000 Program Office on (202) 690-0048.

Attachments

**Department of Agriculture  
Office of the Chief Information Officer  
Year 2000 Program Office**

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**CERTIFICATE OF YEAR 2000 COMPLIANCE**

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**DEFINITION OF YEAR 2000 COMPLIANCE**

Year 2000 means, with respect to Information Technology, that the Information Technology accurately processes date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000 and leap year calculations, to the extent that other information technology, used in combination with the information being acquired, properly exchanges date/time data with it.

-----FEDERAL ACQUISITION REGULATION 39.002

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**This certifies to the Office of the Chief Information Officer that the referenced systems has been assessed and is Year 2000 date compliant. For purposes of this certification, Year 2000 compliance includes information technology, or telecommunication, or vulnerable systems and processes (building's and facilities, or scientific and laboratory equipment.)**

**SYSTEM NAME:** \_\_\_\_\_

**AGENCY:** \_\_\_\_\_

**EXECUTIVE SPONSOR:** \_\_\_\_\_

**DATE:** \_\_\_\_\_



**Department of Agriculture  
Office of the Chief Information Officer  
Year 2000 Program Office**

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SYSTEM NAME:

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AGENCY:

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EXECUTIVE SPONSOR:

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DATE

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